

In the Claims

1. (Currently amended) A method for providing, in a service provider's network, a multicast capability for a customer packet of a virtual private LAN service, comprising:

assigning the virtual private LAN service an Internet Protocol (IP) multicast group address in a private domain of the service provider's network;

at a provider edge device associated with the virtual private LAN service, encapsulating the customer packet of the virtual private LAN service in an service provider IP packet designating the IP multicast group address in accordance with a data communication protocol having a native multicast capability;

transmitting the IP packet over the service provider's network ~~the service provider packet using an IP multicast routing protocol the native multicast capability of the data communication protocol~~ from the provider edge device to a plurality of other provider edge devices associated with the virtual private LAN service; and

at each of the other provider edge devices associated with the virtual private LAN service, upon receiving the ~~provider edge~~ IP packet, recovering the customer packet.

2-4. (Canceled)

5. (Currently amended) The method as in claim ~~[[4]]~~ 1, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside by the service provider for use with virtual private LAN services.

6. (Original) The method as in claim 5, wherein the range set aside by the service provider is selected from a range having an administrative scope local to the service provider's network.

7. (Currently amended) The method as in claim [[4]] 1, ~~wherein the further~~ comprising distributing the Internet Protocol multicast group address using a name server.

8. (Canceled).

9. (Currently amended) The method as in claim [[8]] 1, wherein the IP multicast routing protocol comprises a source-based routing protocol.

10. (Currently amended) The method as in claim [[8]] 1, wherein the IP multicast routing protocol comprises a core-based routing protocol.

11. (Currently amended) The method as in claim [[8]] 1, wherein the IP multicast routing protocol creates a distribution tree for distributing the ~~service provider~~ IP encapsulated customer packet for the virtual private LAN service.

12. (Currently amended) The method as in claim 1, further comprising providing the virtual private LAN service in the service provider's network using an Internet Protocol/Multi-protocol label switching service.

13. (Original) The method as in claim 1, wherein the service provider provides the virtual private LAN service in the context of a Layer 2 virtual private network.

14. (Currently amended) The method as in claim 1, further comprising receiving the customer packet at the provider edge device originating from a customer edge device of a virtual LAN.

15. (Original) The method as in claim 1, further comprising accepting into the service provider's network an IP packet that resembles the structure of the service provider packet for the virtual private LAN service only from the provider edge devices associated with the virtual private LAN service.

16. (Original) The method as in claim 1, further comprising, at each of the other provider edge device, forwarding the customer packet to a customer edge device of a virtual LAN.

17. (Currently amended) A system for providing a customer packet multicast capability in virtual private LAN service implemented on a service provider's network, comprising:

a first provider edge devices associated with the virtual private LAN service adapted to encapsulate [[a]] the customer packet of the virtual private LAN service in an service-provider Internet Protocol (IP) packet designating an IP multicast group address assigned to the virtual private LAN service in accordance with a data communication protocol having a native multicast capability, the first provider edge device including a transmitter for transmitting over the service provider's network the service-provider IP packet using an IP multicast routing protocol the native multicast capability of the data communication protocol; and

a second provider edge device associated with the virtual private LAN service, including a receiver for receiving the service-provider IP packet from the service provider's network, the second provider edge device being adapted to recover the customer packet upon receiving the provider edge packet.

18-20. (Canceled)

21. (Currently amended) The system as in claim [[20]] 17, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside by the service provider for use with virtual private LAN services.

22. (Original) The system as in claim 21, wherein the range set aside by the service provider is selected from a range having an administrative scope local to the service provider's network.

23. (Currently amended) The system as in claim [[20]] 17, further comprising a name server for resolving the Internet Protocol multicast group address within the service provider's network.

24. (Canceled)

25. (Currently amended) The system as in claim [[24]] 17, wherein the IP multicast routing protocol comprises a source-based routing protocol.

26. (Currently amended) The system as in claim [[24]] 17, wherein the IP multicast routing protocol comprises a core-based routing protocol.

27. (Currently amended) The system as in claim [[24]] 17, wherein the IP multicast routing protocol creates a distribution tree for the virtual private LAN service.

28. (Currently amended) The system as in claim 17, wherein the virtual private LAN service in the service provider's network implements an Internet Protocol/Multi-protocol label switching service.

29. (Currently amended) The system as in claim 17, wherein the virtual private LAN service implements a Layer 2 virtual private network.

30. (Original) The system as in claim 17, wherein the first provider edge device comprises an interface to a customer edge device of a virtual LAN from which the customer packet is received.

31. (Original) The system as in claim 17, further comprising an access control mechanism in the service provider's network that accepts an IP packet ~~that resembles the structure of the service provider packet~~ for the virtual private LAN service only from provider edge devices associated with the virtual private LAN service.

32. (Original) The system as in claim 17, wherein the second provider edge device includes an interface to a customer edge device over which the second provider edge device forwards the customer packet.

33. (New) An edge device comprising:

a first port;

a second port; and

a routing engine that (a) encapsulates a customer packet of a virtual private LAN service received at the first port in an IP packet designating an IP multicast group address associated with the virtual private LAN service and provides the IP encapsulated customer packet to the second port for transmitting; and (b) recovers a customer packet of the virtual private LAN service that was encapsulated in an IP encapsulated customer packet received at the second port and designating an IP

multicast group address associated with the virtual private LAN service and provides the recovered customer packet to the first port for transmitting.

34. (New) The edge device of Claim 33, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside for use with virtual private LAN services.

35. (New) The edge device of Claim 34, wherein the range is selected from a range having an administrative scope local to a service provider's network.

36. (New) The edge device of Claim 33, wherein the routing engine is adapted to receive the association between the virtual private LAN service and the Internet Protocol multicast group address from a name server.

37. (New) The edge device of Claim 33, wherein the IP multicast routing protocol comprises a source-based routing protocol.

38. (New) The edge device of Claim 33, wherein the IP multicast routing protocol comprises a core-based routing protocol.

39. (New) The edge device of Claim 33, wherein the IP multicast routing protocol creates a distribution tree for distributing the IP encapsulated customer packets for the virtual private LAN service.

40. (New) The edge device of Claim 33, wherein the IP encapsulated customer packets comprise an Internet Protocol/Multi-protocol label switching service.

41. (New) The edge device of Claim 33, wherein the edge device is adapted to provide the virtual private LAN service in the context of a Layer 2 virtual private network.

42. (New) The edge device of Claim 33, wherein the routing engine is adapted to enforce an access control list at the first port to deny routing packets not associated with an approved virtual private LAN service.

43. (New) An edge device comprising:

a first port;

a second port; and

means for routing that (a) encapsulates a customer packet of the virtual private LAN service received at the first port in an IP packet designating an IP multicast group address associated with the virtual private LAN service and provides the IP encapsulated customer packet to the second port for transmitting; and (b) recovers a customer packet of the virtual private LAN service encapsulated in an IP encapsulated customer packet received at the second port and designating the IP multicast group address with the virtual private LAN service and provides the recovered customer packet to the first port for transmitting.

44. (New) The edge device of Claim 43, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range set aside for use with virtual private LAN services.

45. (New) The edge device of Claim 44, wherein the range set aside is selected from a range having an administrative scope local to a service provider's network.

46. (New) The edge device of Claim 43, wherein the means for routing receives the association between the virtual private LAN service and the Internet Protocol multicast group address from a name server.

47. (New) The edge device of Claim 43, wherein the IP multicast routing protocol comprises a source-based routing protocol.

48. (New) The edge device of Claim 43, wherein the IP multicast routing protocol comprises a core-based routing protocol.

49. (New) The edge device of Claim 43, wherein the IP multicast routing protocol creates a distribution tree for distributing the IP encapsulated customer packets for the virtual private LAN service.

50. (New) The edge device of Claim 43, wherein the IP encapsulated customer packets are distributed in the second network using an Internet Protocol/Multi-protocol label switching service.

51. (New) The edge device of Claim 43, wherein the edge device is adapted to provide the virtual private LAN service in the context of a Layer 2 virtual private network.

52. (New) The edge device of Claim 43, wherein the means for routing enforces an access control list at the first port to deny routing packets not associated with an approved virtual private LAN service.

53. (New) A method to be performed in an edge device, the method comprising:

encapsulating a customer packet of a virtual private LAN service in an internet protocol (IP) packet designating an IP multicast group address that has been associated with the virtual private LAN service; and

transmitting to the IP encapsulated customer packets.

54. (New) A method as in Claim 53, further comprising:



receiving an IP encapsulated customer packet designating the IP multicast group address;

recovering the customer packet from the IP encapsulated customer packet; and  
transmitting the customer packet.

55. (New) The method of Claim 53, wherein the Internet Protocol multicast group address associated with the virtual private LAN service is selected from a range or use with virtual private LAN services.

56. (New) The method of Claim 55, wherein the range is selected from a range having an administrative scope local to a service provider's network.

57. (New) The method of Claim 53, further comprising receiving the association between the virtual private LAN service and the Internet Protocol multicast group address from a name server.

58. (New) The method of Claim 53, wherein the IP multicast routing protocol comprises a source-based routing protocol.

59. (New) The method of Claim 53, wherein the IP multicast routing protocol comprises a core-based routing protocol.

60. (New) The method of Claim 53, wherein the IP multicast routing protocol creates a distribution tree for distributing the IP encapsulated customer packets for the virtual private LAN service.

61. (New) The method of Claim 53, wherein the IP encapsulated customer packets use an Internet Protocol/Multi-protocol label switching service.

62. (New) The method of Claim 53, wherein the virtual private LAN service is in the context of a Layer 2 virtual private network.

63. (New) The method of Claim 53, further comprising enforcing an access control list to deny routing packets not associated with an approved virtual private LAN service.